CHAPTER IV

IV MONITORING PROGRAM, SCOPE AND METHODOLOGY

A. Morphological Data

Webster Lake is located at 43°28'15" N latitude and 71°41'13" W longitude. The lake was formed during glacial advance or recession by deposition of drift (Billings, 1934). Table IV-1 presents Webster Lake's natural physical morphology and Figure IV-1 presents its bathymetry. The bathymetric chart was constructed utilizing in excess of 100 fathometer soundings (NHDES-WSPCD unpublished Data, 1987).

Table IV-1
Webster Lake Natural Physical Morphology
(NHWS&PCC, 1981)

Lake Area	247.75 ha
Maximum Depth	12.2 m
Mean Depth	5.7 m
Volume	14,053,500 m^3
Watershed Area	4,506.6 ha
Flushing Rate	1.5 times/yr

B. Station Locations and Descriptions

Sampling locations (Figure IV-2) were chosen to monitor five subwatershed areas feeding Sucker Brook as well as four locations within Sucker Brook. Three seasonal tributaries to Sucker Brook were also monitored during spring runoff and rain events. Data from seasonal streams are sparse and not included in any statistical analysis. The lake station is located at the deepest portion of Webster Lake and included 3 stratification layers. Table IV-2 presents a brief description of each sample station.

Webster Lake

Franklin, N.H.

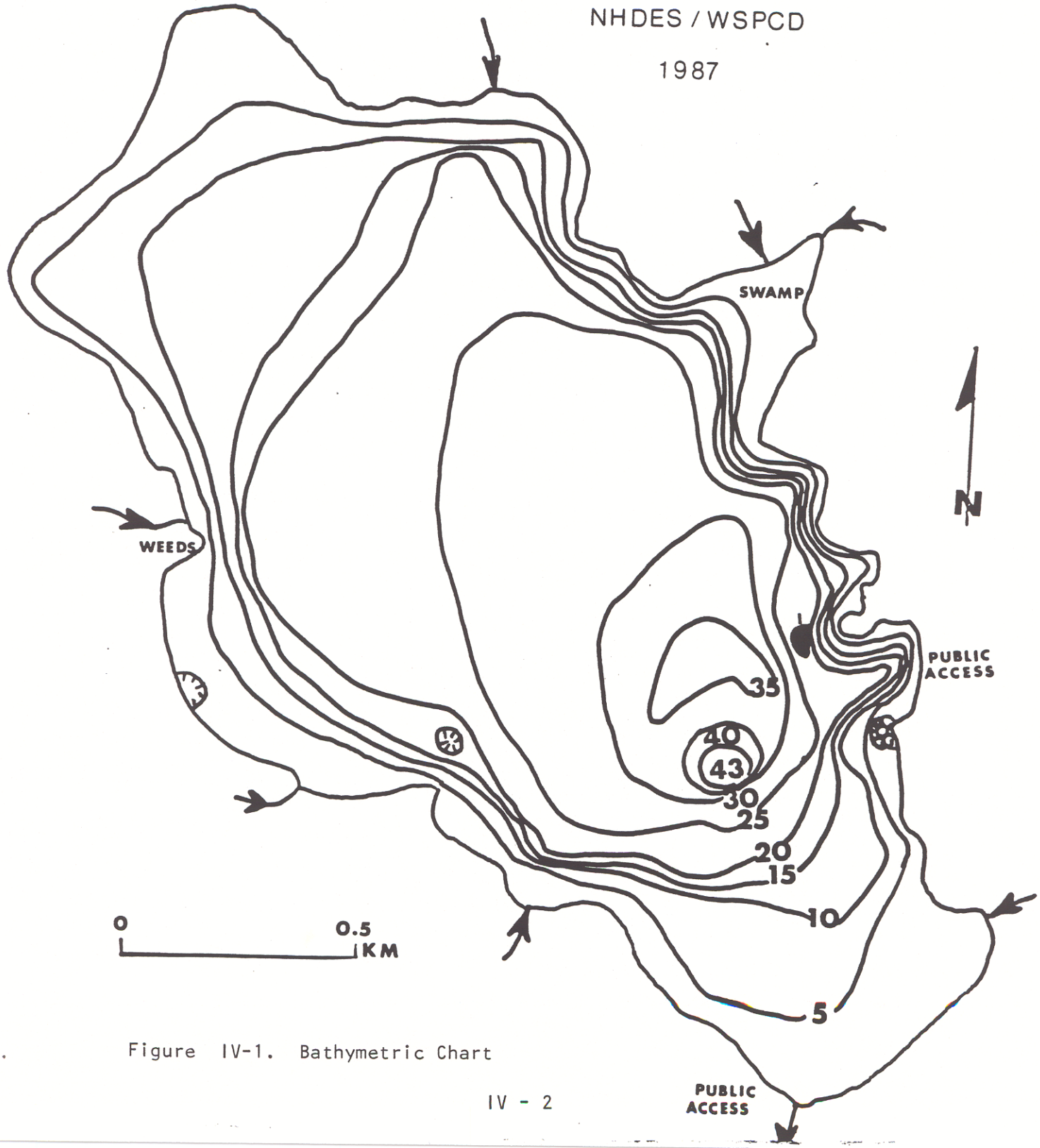

Figure IV-1. Bathymetric Chart

Table IV-2. Sucker Brook Sample Site Description

Site Number	Site Description
1	Below Highland Lake Outlet, Sucker Brook
2	Sucker Brook, Below 3 Brooks
3	Cilley Hill Brook, tributary
4	Dyers Crossing, Sucker Brook
5	Emory Pond Brook, tributary
6	Bald Hill Brook, tributary
7	Reep Farm, Sucker Brook
8	Apple Farm Brook, tributary
9	Webster Inlet, Sucker Brook before entry to Webster Lake
10	Hembirch Brook, Seasonal Tributary
11	Waterfall Brook, Seasonal Tributary
12	Clay Pond Outlet, Seasonal Tributary

C. Field Procedures

1. Lake Field Procedures

Lake stations were sampled monthly from November 1987 through June 1989. Additional sampling was conducted during the summer of 1988 and 1989 by lake monitors from the Webster Lake Association. These additional samples were collected under the NHVLAP. Sample parameters and locations are listed in Table V-1.

Temperature and dissolved oxygen were measured at one meter intervals using a YSI model 50, 54 or 57 oxygen meter.

Water samples were collected with a Wildco Kemmerer water sampler. All samples were preserved according to EPA Standard Procedures. Samples were stored in a cooler and immediately returned to the NHDES laboratories in Concord for analysis.

Transparency was measured to the nearest 0.1 meter using a 20 cm Secchi disk with alternate white and black quadrants. Net phytoplankton and zooplankton were collected by hauling an 80 micron net vertically from the thermocline to the surface. One plankton sample was preserved in the field with Lugol's solution, a second was returned live to aid in species identification. Whole water phytoplankton, for inverted microscope density counts, and chlorophyll-a samples were collected with an integrated water sampler (a weighted 1" ID tube,) or by compositing Kemmerer samples from successive depths to the thermocline.

2. Stream Field Procedures

The tributary stations were sampled at least every two weeks from October 1987 through December 1988. Staff gage measurements were recorded each sampling trip. Flow measurements were taken during ice-out conditions using a Marsh McBirney model 201D flow meter. Samples were collected by dipping laboratory bottles to mid-depth at mid-stream in flowing water. Table V-1 lists each of the parameters sampled.

D. Laboratory Methodology

1. Chemical and Physical

Table IV-3 presents the laboratory methods utilized for chemical and physical parameters. Acid Neutralizing Capacity, pH, specific conductance, and color analyses were performed by biologists in the Limnology Center. Chloride, sulfate, total phosphorus, nitrate nitrogen, and total Kjeldahl nitrogen analyses were performed by the Laboratory Services Unit. Both the Limnology Center and the Laboratory Services Unit are EPA inspected with approved quality assurance and quality control programs.

2. Biological

Table IV-3 also presents the laboratory methods utilized for biological parameters. All analyses were performed by Biologists in the Limnology Center. Phytoplankton and zooplankton were identified to genus. Relative abundance was computed for net phytoplankton. Zooplankton and phytoplankton densities were also determined. Chlorophyll-a measurements, and actual cell densities were used to determine algal biomass.

Table IV-3. Laboratory parameter and method used for analysis.

Parameter	Method
pH	Electrometric
Acid Neutralizing Capacity	Titration, Electrometric, Granplot
Total Phosphorus	Colorimetric, persulfate digestion
Specific Conductance	Wheatstone bridge type meter
Apparent Color	Colorimetric, Platinum-cobalt
Chloride	Ion Chromatography
Sulfate	Ion Chromatography
Nitrate Nitrogen	Ion Chromatography
Total Kjeldahl Nitrogen	Auto-Analyzer with block digester
Net phytoplankton (relative abundance)	Phase Contrast Microscopy, Sedgwick-Rafter Cell
Zooplankton (density counts)	Phase Contrast Microscopy, Sedgwick-Rafter Cell
Whole-water phytoplankton	Inverted Microscope, settling chamber
Chlorophyll-*a*	Spectrophotometric, Trichromatic